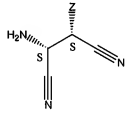
AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method for synthesizing pentostatin, a pentostatin analog, pentostatin aglycone, or a pentostatin aglycone analog which method comprises the steps of:

converting a dialkyl tartarate to a succinonitrile derivative having the formula:

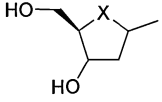


wherein Z is OR_{15}, wherein R_{15} is a protecting group;

reacting the succinonitrile derivative with an iminoether selected from:

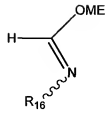
(a) an iminoether having the formula

wherein R is ~~H~~ a protecting group or

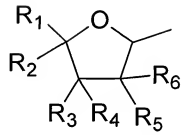


wherein X is O, S, NH, or CH_2; or

(b) an iminoether having the formula

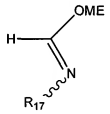


wherein R_{16} is

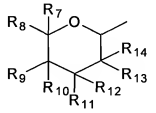


wherein R_1, R_2, R_3, R_4, R_5, and R_6 are independently selected from OH, H, methyl, alkyl, CH_2OH, a halogen, a substituted or unsubstituted O-R' group, a substituted or unsubstituted S-R' group, or a NR'R" group, wherein R' and R" are independently a straight-chained or substituted alkyl or alkenyl group; or

(c) an iminoether having the formula



wherein R_{17} is



wherein R_7, R_8, R_9, R_{10}, R_{11}, R_{12}, R_{13}, and R_{14} are independently selected from OH, H, methyl, alkyl, CH_2OH, a halogen, a substituted or unsubstituted O-R'" group, a substituted or

unsubstituted S-R''' group, or a NR'''R'''' group, wherein R''' or R'''' are independently a straight-chained or substituted alkyl or alkenyl group;

to form a imidazole[[-]]~~containing~~ ring compound, wherein the imidazole[[-]]~~containing~~ ring compound comprises a moiety having a cyano group;

reducing the cyano group on the imidazole[[-]]~~containing~~ ring compound to a primary amino group; ~~and~~

cyclizing the primary amino group with a second amino group on the imidazole[[-]] ~~containing~~ ring compound; and

removing any protecting groups to obtain pentostatin, pentostatin aglycone, a pentostatin ~~analog~~ compound, wherein the pentostatin compound is selected from:

(a) a pentostatin analog in which the oxygen atom in the sugar moiety is replaced with a sulfur atom, a NH group, or a CH_2 group;

(b) a pentostatin analog in which the sugar moiety is based on arabinose, xylose, ribose, lyxose glucose, galactose, manose, gulose, idose, talose, altrose, allose, fructose, sorbose or tagatose instead of deoxyribose; and

(c) ~~or~~ a pentostation aglycone analog ~~in~~ which does not contain a sugar moiety, and wherein the carbon atom between the two nitrogen atoms on the seven-member ring is altered.

2. (Original) The method of claim 1, wherein the dialkyl tartarate is in either the L or D enantiomeric form.

3. (Original) The method of claim 2, wherein the dialkyl tartarate is L-Diethyl tartarate.

4. (Original) The method of claim 2, wherein the dialkyl tartarate is D-Diethyl tartarate.

5. (Canceled)

6. (Previously presented) The method of claim 22, wherein the primary amine has the formula R_{21}-NH_2, wherein R_{21} is a substituted or unsubstituted alkyl group, a substituted or unsubstituted alkenyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted aralkyl group, a substituted or unsubstituted cycloalkyl group, a substituted or unsubstituted alkoxyalkyl group, or a substituted or unsubstituted heteroaryl group.

7. (Previously presented) The method of claim 6, wherein the primary amine is benzyl amine, allyl amine, beta-cyanoethyl amine, or p-methoxy benzyl amine.

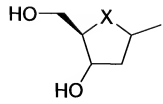
8. (Previously presented) The method of claim 1, wherein the iminoether has the formula

wherein R is deoxyribose, ribose, arabinose, xylose, ribose, lyxose, glucose, galactose, mannose, gulose, idose, talose, altrose, allose, fructose, sorbose, or tagatose.

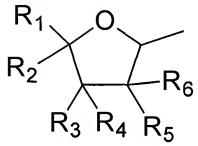
9. (Original) The method of claim 8, wherein R is deoxyribose, the dialkyl tartarate is L-diethyl tartarate, and pentostatin is synthesized.

10. (Previously presented) The method of claim 1, wherein the iminoether has the formula

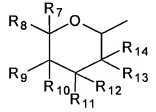
wherein R is



wherein X is O, S, NH, or CH_2, or



wherein R_1, R_2, R_3, R_4, R_5, and R_6 are independently selected from OH, H, methyl, alkyl, CH_2OH, a halogen, a substituted or unsubstituted O-R' group, a substituted or unsubstituted S-R' group, or a NR'R" group, wherein R' and R" are independently a straight-chained or substituted alkyl or alkenyl group; or



wherein R_7, R_8, R_9, R_{10}, R_{11}, R_{12}, R_{13}, and R_{14} are independently selected from OH, H, methyl, alkyl, CH_2OH, a halogen, a substituted or unsubstituted O-R'" group, a substituted or unsubstituted S-R'" group, or a NR'"R"" group, wherein R'" or R"" are independently a straight-chained or substituted alkyl or alkenyl group.

11. (Original) The method of claim 1, wherein the cyclization is performed with an orthoformate.

12. (Previously presented) The method of claim 11, wherein the orthoformate has the formula $HC(OR_{18})_3$, wherein R_{18} is a straight-chained or substituted alkyl group.

13. (Original) The method of claim 1, further comprising the step of glycosylating the pentostatin aglycone or the pentostatin aglycone analog.

14. (Original) The method of claim 13, wherein the pentostatin aglycone is glycosylated with deoxyribose to obtain pentostatin.

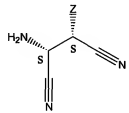
15. (Canceled)

16. (Previously presented) The method of claim 1, wherein R_{15} is TBDMS, $SiPh_2C(CH_3)_3$, an acetyl group, dimethoxytrityl, or Methylthioethyl amine.

17. (Original) The method of claim 1, wherein the primary amino group comprises a protecting group, and the protecting group is removed after cyclization.

18. (Currently amended) A method for synthesizing pentostatin or a pentostatin analog, which method comprises the steps of :

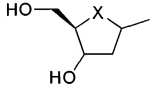
converting a L diethyl tartrate to a succinonitrile intermediate, the intermediate having the formula:



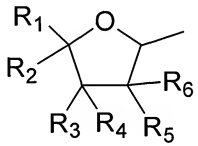
wherein Z is OR_{19}, wherein R_{19} is a protecting group;

reacting the succinonitrile intermediate with an amino sugar intermediate having the formula:

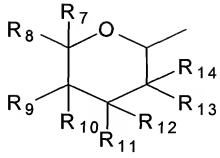
wherein R_{20} is



wherein X is O, S, NH, or CH_2; or wherein R_{20} is



wherein R_1, R_2, R_3, R_4, R_5, and R_6 are independently selected from OH, H, methyl, alkyl, CH_2OH, or a halogen; or wherein R_{20} is



wherein R_7, R_8, R_9, R_{10}, R_{11}, R_{12}, R_{13}, and R_{14} are independently selected from OH, H, methyl, alkyl, CH_2OH, or a halogen,

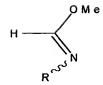
to form a imidazole[[-]]~~containing~~ ring compound, wherein the imidazole[[-]]~~containing~~ ring compound comprises a moiety having a cyano group;

reducing the cyano group on the imidazole[[-]]~~containing~~ ring compound to a primary amino group; and

adding a orthoformate to cyclize the primary amino group with a second amino group on the imidazole[[-]]~~containing~~ ring compound; and

removing the protecting group to obtain pentostatin or the pentostatin ~~analog~~ compound, wherein the pentostatin ~~analog~~ compound is selected from:
(a) a pentostatin analog in which the oxygen atom in the sugar moiety is replaced with a sulfur atom, a NH group, or a CH_2 group; and
(b) a pentostatin analog in which the sugar moiety is based on arabinose, xylose, ribose, lyxose glucose, galactose, manose, gulose, idose, talose, altrose, allose, fructose, sorbose or tagatose instead of deoxyribose.

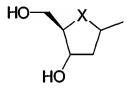
19. (Previously Presented) The method of claim 18, wherein the amino sugar intermediate has the formula



wherein R is deoxyribose, ribose, arabinose, xylose, ribose, lyxose, glucose, galactose, mannose, gulose, idose, talose, altrose, allose, fructose, sorbose, or tagatose.

20. (Original) The method of claim 19, wherein R is deoxyribose.

21. (Original) The method of claim 18 wherein R is



wherein X is S, NH, or CH_2.

22. (Previously presented) The method of claim 1, wherein the iminoether is obtained from a reaction of ammonia or primary amine with a trimethyl orthoester.